

central in the northern portion of New England, but the barometric pressure at the centre had increased from 29.11 to 29.44 within twenty-four hours.

The following notes, as to this storm, are of interest:

Columbus, Ohio: on the 28th heavy rain fell from 3 to 9 a. m., with thunder-storm from 5 to 6.10 a. m. At 11.55 a. m. a westerly gale set in, it suddenly increased in velocity at 1.25 p. m. and blew at the rate of forty-six miles per hour; the rainfall was very heavy. The gale continued, with occasional gusts of high velocity, until 7 p. m. Property in the city was damaged to the extent of \$2,000. At Cincinnati the wind blew from the northwest at the rate of forty-eight miles per hour, and was accompanied by heavy rain. The rainfall was heavy at Louisville, Ky.; highest velocity of wind forty miles.

Pittsburg, Pa.: on the 28th rain fell from 7.50 a. m. until 6.30 p. m., and heavily from 10.30 to 11.30 p. m. For a few minutes after 11 p. m. hail fell. Brisk southwesterly winds prevailed, reaching a velocity of thirty miles per hour at 11.15 p. m. The pressure at 3 p. m. stood at 29.27, this was the lowest reading since January 9, 1886. The total rainfall of the twenty-four hours ending 7 a. m. of the 29th was 2.66 inches.

Lynchburg, Va.: on the 28th the barometer fell rapidly until 3 p. m. when it stood at 29.40; southerly shifting to brisk northwest winds. Between 3 and 4 p. m. a thunder-storm moving from west to east, and accompanied for a few minutes by hail, occurred. During the afternoon the wind attained for a few minutes the velocity of thirty-six miles per hour. In Amherst county the storm exhibited unusual violence and the rain was heavy. Near Riverville a

tobacco house was blown down and one person killed. Reports from a number of places in the state show that the storm was widespread and severe.

Variety Mills, Nelson Co., Va.: the storm accompanying the depression of the 28th was very destructive in this vicinity. At 3 p. m. a heavy mass of clouds approached from the northwest and rain began falling heavily, accompanied between 3.30 and 4 p. m. by hail. Shortly after the rain began falling a gale set in, unroofing several buildings and prostrating trees.

Hatteras, N. C.: on the morning of the 28th high west and southwest winds prevailed. During the afternoon a heavy thunder-storm with high wind occurred, maximum velocity forty-nine miles per hour. The wind continued high on the 29th; maximum velocity, forty miles per hour, from the west.

XIII.—The complete history of this storm will be found in the REVIEW for the succeeding month. It was central north of Montana on the 29th and passed almost directly southward to northern Nebraska, where it was central at the close of the month, the general form of the depression being elliptical and extending from Colorado to northern Minnesota, and the lowest isobar being 29.3. The barometric gradient was greatest to the westward, the pressure increasing quite regularly to the north Pacific coast, where it had reached 30.4, showing a barometric range of 1.23 inches between the upper Missouri valley and eastern Oregon.

NORTH ATLANTIC STORMS DURING APRIL, 1887.

[Pressure in inches and millimetres; wind-force by Beaufort scale.]

The paths of the depressions that have appeared over the north Atlantic Ocean during the month are determined, approximately, from international simultaneous observations furnished by captains of ocean steamships and sailing vessels; abstracts of ships' logs and other data collected by the Signal Service agencies at the ports of New York, Boston, and Philadelphia; reports received through the co-operation of the "New York Herald Weather Service;" abstracts of ships' logs furnished by the proprietors of the "New York Maritime Register," and from other miscellaneous data received at this office up to May 21, 1887.

Eleven depressions are traced over the ocean and the Canadian Maritime Provinces, the tracks largely predominating, as in March, 1887, to the southward and southeastward of Nova Scotia and Newfoundland. Four storms passed northeast from Nova Scotia; three moved eastward to the south and southeast margin of the ice region, where they remained nearly stationary as areas of low pressure during periods of from two to nine days. Two depressions appeared in European waters and apparently passed south of east over the continent; one is first charted over mid-ocean, and one moved westward north of the Azores and united with an area of low pressure off the southeast edge of the Banks of Newfoundland. But one depression is traced from American waters to the European coast.

The general character of the weather over the north Atlantic Ocean was unusually severe during a greater portion of the first two decades of the month. From the 1st to the 5th, inclusive, gales of hurricane force were encountered off the coast of the United States. From the 12th to the 16th, inclusive, gales of exceptional violence prevailed over, and to the eastward of, the Banks of Newfoundland. During the last decade of the month the weather conditions in the trans-Atlantic routes were more settled, although strong gales were experienced over the western portion of the ocean from the 26th to the 29th. The depressions attained greatest force west of the thirty-fifth meridian, which fact may be attributed to the high temperatures reported in the waters of the Gulf Stream in the vicinity, and somewhat to the northward of, the thirty-fifth parallel, whereby the storms which passed over its surface acquired material for the development of great energy. Barometric pressure was high over, and to the eastward of, the Banks of Newfoundland until the 3d, when a depression advancing from the southwest caused a decided fall in the barometer over the Banks and Maritime Provinces. On the 4th a rapid decrease in pressure over the ocean northwest of the

British Isles indicated the presence of a storm-area which apparently passed eastward over Scotland into the North Sea by the 5th. The barometric pressure over mid-ocean fluctuated until the 12th, after which it continued generally low until the 26th, attending the presence to the westward of areas of low pressure. During the last four days of the month the barometer was high over mid-ocean and slowly rising in the vicinity of the British Isles.

For April, 1886, thirteen depressions were traced, of which, one was the continuation of an area of low pressure traced on the North American continent; one was traced on the coast of Ireland; one originated northeast of the Bahamas; one appeared in the Gulf of Saint Lawrence; one developed near Charleston, S. C., and the remaining depressions first appeared over the ocean east of the fiftieth meridian, between the thirty-seventh and fiftieth parallels. The direction of movement of the depressions was greatly diversified, and their positions extended from N. 37° to 55°, and from W. 50° to the European coast. An additional noteworthy characteristic of the storms of that month was their exceeding slow rate of progression.

As compared with the corresponding month of previous years, the number of depressions which appeared during April, 1887, was somewhat less than the average for the month, while their direction of movement and position did not differ materially. A noticeable and unusual feature was the continuation, during a greater portion of the month, of severe disturbances to the eastward and southward of the Banks of Newfoundland.

The following are brief descriptions of the depressions traced:

1.—This depression was central in about N. 38°, W. 13° on the 1st, with central pressure ranging below 29.60 (751.8), whence it apparently moved eastward to the Mediterranean Sea.

2.—This depression was a continuation of land-area number xi traced for March, 1887, which passed off the coast of the United States in about N. 35° during the evening of March 31st. On the morning of April 1st the storm was central in N. 37°, W. 72°, with fresh to strong gales over a limited area. By the 2d the centre of depression had advanced northeast to N. 40°, W. 69°, with central pressure about 29.30 (744.2) and an appreciable increase in energy. By the 3d the storm-centre had passed northeast to the south coast of Nova Scotia, accompanied by gales of great violence and very low barometric pressure. From this position the depression moved northeastward over Newfoundland beyond the region of observation.

The following special reports refer to disturbances accompanying the passage of this depression:

Capt. Charles Brown, of the bkt. "Josephine," reports a nw. gale of hurricane force on the 1st, in N. $31^{\circ} 11'$, W. $75^{\circ} 0'$, at noon; previous to gale (which commenced at 19 hours) the wind had veered from sse. to sw., with falling barometer. Capt. J. H. Taat, of the s. s. "Edam," reports a storm on the 2d; wind veered from se. to wnw.; lowest barometer, 29.17 (740.9), at 4 a. m., in N. $41^{\circ} 33'$, W. $61^{\circ} 12'$. Capt. C. E. Durkee, of the ship "Mable Taylor," reports a heavy ne. backing to nw. gale on the 2d, in N. $37^{\circ} 12'$, W. $73^{\circ} 10'$, at noon, with very heavy ne. and nw. cross sea. Capt. J. S. Garvin, of the s. s. "Orinoco," reports a strong s. veering to sw. gale on the 2d, in N. $36^{\circ} 25'$, W. $67^{\circ} 34'$, at noon, with rain and heavy sea; barometer 29.12 (739.6), rising rapidly in p. m.

Capt. J. P. Stowers, of the brig "L. Staples," was in the centre of a cyclonic area at 8.30 p. m.: position at noon, N. $38^{\circ} 17'$, W. $69^{\circ} 40'$. Wind then came from nw. with almost hurricane force, accompanied by fearful sea and hail and rain-squalls. Third Officer J. H. Mills, of the s. s. "Aurania," Capt. W. H. P. Haines, commanding, reports a gale of force 12, veering from sse. to w., on the 2d; lowest barometer, 29.06 (738.1), at midnight, in N. $40^{\circ} 42'$, W. $65^{\circ} 18'$. Capt. Thomas Craig, of the s. s. "Italia," reports a whole se. to nw. gale on the 2d; lowest barometer, 29.59 (751.6), at 8 p. m., in N. $36^{\circ} 44'$, W. $63^{\circ} 15'$. Capt. R. Potter, of the s. s. "Santiago," reports a strong gale on the 3d; wind veered from s. to wnw.; lowest barometer, 29.59 (751.6), at 8 a. m., in N. $40^{\circ} 30'$, W. $54^{\circ} 40'$.

3.—This depression is charted in N. 54° , W. 25° , under date of the 6th, whence it passed southeast and apparently united with an area of low pressure which appeared off the northeast coast of Spain on the 7th. The depression was relatively shallow and was unaccompanied by noteworthy features.

4.—This depression was a continuation of land-area number iii which passed northeast over Nova Scotia during the 6th. By the 7th the centre of depression had moved northeast to the northern extremity of Newfoundland, whence it disappeared beyond the region of observation. The depression was of slight depth, but occasioned gales of considerable strength, as is shown by the following reports:

Capt. W. Dalziel, of the s. s. "Manitoban," reports a heavy ssw. to w. gale during the night of the 5-6th; lowest barometer, 29.80 (756.9), at midnight, in N. $40^{\circ} 50'$, W. $63^{\circ} 54'$. Capt. Thomas Craig, of the s. s. "Italia," reports a strong gale, attaining greatest force on the 5th, in N. $39^{\circ} 6'$, W. $68^{\circ} 25'$; wind veered from s. to nw.; lowest barometer, 29.71 (754.6), at 10 p. m.

5.—This depression appeared off the northwest coast of Spain on the 7th and moved slowly west to N. 44° , W. 16° by the 8th. By the 9th the storm-centre had passed southwest to N. 42° , W. 22° , whence it circled north of west and united with depression number 6 on the 11th. This well-defined storm possessed slight depth and exhibited small energy.

6.—This depression apparently originated over the ocean to the southeast of Nova Scotia and moved eastward to N. 40° , W. 49° by the 9th. During the next nine days the depression circled in a diversified course over the ocean to the southeast and east of the Banks of Newfoundland. During this period the pressure gradually decreased within the storm-area until the 15th, when readings ranging below 28.50 (723.9) were shown. Subsequent to the 15th there was a decided increase in barometric pressure. From the 18th to the 21st, inclusive, the depression is traced from N. 50° , W. 40° to the north of Ireland, a marked loss of strength being shown after the storm-area passed to the eastward of the thirty-fifth meridian.

The following special reports show the exceptional violence of the disturbances encountered within the area of this depression over the western portion of the ocean:

Capt. H. McKay, of the s. s. "Servia," reports a gale which veered from se. to w. at 8.40 p. m. of the 13th, in N. $46^{\circ} 18'$, W. $39^{\circ} 55'$, at which time the barometer stood 29.02 (737.1). Capt. W. R. Lord, of the s. s. "Critic," reports a hurricane on the 14th; wind veered from s. to n.; lowest barometer,

29.23 (742.4), at noon, in N. $42^{\circ} 36'$, W. $54^{\circ} 41'$. Capt. E. Parry, of the s. s. "Bulgarian," reports a whole nw. gale attaining greatest force on the 13th, at 10.30 p. m., in N. $42^{\circ} 48'$, W. $54^{\circ} 30'$, when barometer read 28.95 (735.3). Advices from Saint John's, Newfoundland, stated that considerable loss of life and property resulted from the gale of the 12-13th. Capt. A. Kuhn, of the s. s. "Polynesia," reports a storm attaining force 11 on the 14th, in N. $40^{\circ} 50'$, W. $55^{\circ} 30'$. The s. s. "Servia" encountered a gale from se. backing to nne., at 8.10 p. m. of the 14th, in N. $43^{\circ} 11'$, W. $47^{\circ} 20'$, when barometer read 28.92 (734.6). Capt. W. Rea, of the s. s. "Bassano," reports a strong s. to nw. gale from the 13th to 15th; lowest barometer, 28.73 (729.7), at 8 a. m. of the 14th, in N. $39^{\circ} 40'$, W. $49^{\circ} 10'$. Capt. W. A. Griffiths, of the s. s. "Spain," reports a strong westerly gale on the 14th; lowest barometer, 28.29 (718.6), at 7 p. m., in N. $41^{\circ} 28'$, W. $46^{\circ} 10'$. Capt. D. Pert, of the s. s. "Alexandria," reports a s. to w. hurricane on the 14th; lowest barometer, 28.75 (730.2), at midnight, in N. $40^{\circ} 28'$, W. $39^{\circ} 20'$. Capt. C. N. Mumford, of the s. s. "Earnwell," reports a strong nw. gale on the 13th and 14th; lowest barometer, 29.10 (739.1), at 4 a. m. of the 14th, in N. $36^{\circ} 22'$, W. $54^{\circ} 58'$. Capt. A. D. Hadley, of the s. s. "France," reports a storm from the 13th to 15th; wind veered from se. to sw.; lowest barometer, 28.48 (723.4), at 4 a. m. of the 15th, in N. $42^{\circ} 48'$, W. $40^{\circ} 13'$. Commodore W. G. Randle, commanding the s. s. "Westernland," reports a s. to wsw. gale during the 14th and 15th; lowest barometer, 28.47 (723.1), at 8 a. m. of the 15th, in N. $43^{\circ} 22'$, W. $40^{\circ} 44'$. Capt. John McKeague, of the s. s. "Dorian," reports a gale on the 14th and 15th; wind veered from se. to wnw.; lowest barometer 28.30 (718.8); barometer rose during the 15th; position at noon (Greenwich mean time) of the 14th, N. $41^{\circ} 50'$, W. $44^{\circ} 40'$; at noon of the 15th, N. $42^{\circ} 33'$, W. $42^{\circ} 0'$. Mr. J. Higgins, observer at Saint John's, Newfoundland, reports: "On the 15th the wind was ne. blowing brisk, with light rain; at 9 p. m. the wind attained force of strong gale and continued till early next morning."

7.—This depression advanced northeast over the northern extremity of Newfoundland during the morning of the 12th, and, while possessing considerable depth, passed too far to the northward of the region of observation to be severely felt in the trans-Atlantic track.

8.—This depression was a continuation of land area number viii which left the coast of the United States in about N. 40° during the early morning of the 16th. By the 17th the centre of depression had advanced eastward over the ocean to the south of Nova Scotia, with central pressure about 29.30 (744.2), whence it passed eastward to the fifty-first meridian by the 18th, with a slight increase in barometric pressure. By the 19th the storm-centre had shifted slightly to the northeastward, after which it dissipated. No special reports have been received relative to the disturbances accompanying this depression, which were apparently of small force.

9.—This depression was a continuation of land area number ix which passed off the coast in about N. 37° during the evening of the 18th. By the 19th the centre of depression had advanced to the southward of Nova Scotia, where pressure ranging below 29.40 (746.7) was shown. During the next two days the storm-centre moved slowly eastward to the south of Newfoundland, without evidence of marked energy; it then circled southeast to the fortieth parallel, where it remained, with slight changes in position, until the 25th, after which it filled up. The depression was relatively shallow throughout its course, and was unaccompanied by noteworthy features.

10.—This depression appeared in N. 57° , W. 14° on the 22d, and passed southeast over Ireland by the 23d, with barometric pressure below 29.00 (736.6), after which it apparently moved northeast over Scotland beyond the region of observation. The depression was accompanied by fresh to strong gales over the ocean to the twenty-fifth meridian, relative to which the following report has been made:

Capt. J. B. Watt, of the s. s. "Samaria," reports a strong

nw. gale on the 22d; lowest barometer, 29.48 (748.8), at 4 p. m., in N. 51° 0', W. 16° 50'.

11.—This depression was a continuation of land area number xi which advanced from the Gulf of Mexico along the east coast of the United States to the Gulf of Saint Lawrence during the 25th and 26th. During the 27th the centre of depression passed northeast over the west portion of Newfoundland, beyond the region of observation. The depression gathered energy during its passage along the coast, and occasioned strong gales in the vicinity of the fortieth parallel on the 26th, as is shown by the following reports:

Capt. W. Stamper, of the s. s. "Worcester," reports a strong gale on the 26th and 27th; wind veered from e. to w.; lowest barometer, 29.58 (751.3), at 8 a. m. of the 26th, in N. 41° 0', W. 63° 30'. Capt. D. W. Storer, of the brig "Abbie Clifford," reports a strong gale on the 26th; wind veered from e. to sw.; lowest barometer 29.60 (751.8); position at noon, N. 36° 10', W. 73° 45'. Capt. C. Thomas, of the s. s. "Monte Rosa," reports a gale on the 25th and 26th; wind veered from e. to wsw. and blew hardest from wsw., with heavy cross sea; position at noon of the 25th, N. 42° 0', W. 59° 0'.

OCEAN ICE.

During April, 1887, icebergs and field ice were reported as follows:

Date.	Vessels.	Position. Lat. N. Lon. W.	Remarks.
1	S. S. Werra	42 52 48 19	One iceberg.
2	S. S. Palestine	43 00 49 00	Two small bergs.
	S. S. Werra	42 20 49 50	One berg and several pieces.
	S. S. Austrian	43 00 48 11	One berg.
	S. S. Venetian	48 00 38 18	A piece of ice.
3	S. S. British Queen	44 16 49 08	Two icebergs.
4	S. S. Austrian	Off Cape Race	Several large bergs.
	S. S. Ludgate Hill	43 04 49 56	One very large berg.
	S. S. Baltic	49 47 49 20	Two pieces of ice.
5	do	42 47 49 20	Two large bergs.
	S. S. Adriatic	43 04 49 20	Four icebergs and two floes.
	S. S. Hungary	42 59 49 50	
	S. S. Hungary	42 14 49 22	Small bergs.
	S. S. Montauk	42 00 49 55	
	S. S. Ems	43 30 49 35	Three small bergs.
	S. S. Ems	43 55 49 02	Field ice.
6	S. S. Hungarian	42 14 49 22	Icebergs.
7	S. S. Suevia	42 44 49 23	Small pieces of ice.
	S. S. Umbria	42 28 48 33	One iceberg.
	S. S. Austrian	Off Ferryland Head	Two large bergs.
8	do	44 56 55 30	Several large bergs.
	S. S. Siberian	42 28 48 28	One large berg.
	S. S. Arabic	43 34 49 53	One small berg.
	S. S. Rotterdam	42 28 48 28	Do.
	S. S. Circassian	43 21 50 27	Do.
10	S. S. Montmore	41 10 50 00	Three large bergs.
	S. S. Rotterdam	41 55 49 23	Passed n. of two large bergs.
12	S. S. Bulgarian	43 04 49 27	Two bergs.
	S. S. Trave	42 07 49 46	One small berg.
	S. S. Wetherby	42 02 48 20	One large berg.
14	Bk. Maury	45 30 48 00	Three small bergs.
16	S. S. Portia	65 miles e. of Cape Breton.	Heavy ice field; cleared it 15 miles n. of Sable Island.
	Bk. Maury	43 00 50 00	Large bergs and field ice.
17	S. S. State of Nevada	40 02 50 04	One small berg.
18	S. S. Glueckauf	42 02 49 54	One berg.
18, 20, 21	S. S. Zaanland	41 28 47 49	Ice at sea off Saint John's, N. F.
	S. S. Nova Scotian	48 09 51 05	One berg.
	S. S. Straits of Gibraltar	42 30 46 50	Pieces of field ice.
20	S. S. Nova Scotian		Large quantities of heavy ice in Saint John's entrance.
21	S. S. La Bretagne	43 36 47 34	Three small bergs.
	S. S. Newfoundland		Ice on Misaine bank, s. of Liscomb, and packed ice off Witchavon.
	S. S. St. Pierre	Cape Breton to Beaver Island.	Heavy field ice.
22	S. S. Ashburne	43 40 46 40	One large berg.
23	S. S. Highland Prince	46 27 49 03	Three large icebergs.
	S. S. Nova Scotian	Between Cape Spear and Cape Race.	Several large bergs.
	S. S. Lufrin	80 miles e. of Virgin Rocks.	Do.
25	S. S. Nova Scotian	44 08 61 47	Field ice.
28	S. S. Samaria	42 40 50 01	One moderate sized berg.
	S. S. Hermann	42 00 49 00	Several bergs.
	S. S. Samaria	42 23 50 07	One large berg.
29	S. S. Oregon	46 27 54 28	One berg.
	S. S. Ilberman	42 20 50 18	One small berg.
30	S. S. Werra	42 20 50 28	One large berg.
	S. S. De Ruyter	43 37 48 00	One iceberg.

On chart i are also exhibited the limits within which icebergs and field ice were reported during April, 1887. These

limits are determined from reports furnished by shipmasters, and from data collected by the Signal Service agencies.

The easternmost ice was passed on the 3d, in N. 48° 00', W. 38° 18', by the s. s. "Venetian," and the southernmost ice reported was observed on the 17th, in N. 40° 02', W. 50° 04', from the s. s. "State of Nevada."

Ice was most frequently encountered during the month on the southern edge of the Banks of Newfoundland in the vicinity of the fiftieth meridian. Large icebergs and field ice were reported, at intervals, off the east and southeast coasts of Newfoundland, and from the 16th to the 25th heavy field ice was observed from Cape Breton to Sable Island.

As compared with ice reported during March, 1887, there has been an increase in the quantity encountered off the Newfoundland coast and in the vicinity of Cape Breton and Sable Island, while over the Banks of Newfoundland and in the trans-Atlantic routes there was a deficiency.

As compared with April, 1886, the eastern limit is about eight degrees further west, and the southern limit nearly one degree further south.

As compared with the corresponding month of previous years, the ice reported by trans-Atlantic steamers was somewhat deficient, which fact is attributed to vessels more nearly following the southerly and safer route. Reports show that the water temperature in the trans-Atlantic route increased but slightly, as compared with March, which would indicate but a small diminution in the southward trend of the ice-fields.

The following table shows the southern and eastern limits of the region within which ice was reported for April during the last six years:

Southern limit.			Eastern limit.		
Month.	Lat. N.	Lon. W.	Month.	Lat. N.	Lon. W.
April, 1883	40 49	52 06	April, 1883	48 00	43 00
April, 1884	41 26	48 46	April, 1884	45 25	43 34
April, 1885	41 40	49 50	April, 1885	44 10	39 41
April, 1886	40 51	46 39	April, 1886	47 43	30 11
April, 1887	40 02	50 04	April, 1887	48 00	38 18

FOG.

The following table shows the limits of fog-areas on the north Atlantic Ocean during April, 1887, as reported by shipmasters:

Date.	Vessel.	Entered.			Cleared.		
		Lat. N.	Lon. W.	Time.	Lat. N.	Lon. W.	Time.
6	S. S. Ems	43 16	51 13		42 58	53 22	
6	S. S. Rotterdam	40 28	70 46		40 28	69 36	
6	do	40 28	69 18		40 28	69 00	
7	S. S. Sueva	42 42	49 53	2 a. m.	42 41	50 07	3 a. m.
12	S. S. Britannic	44 22	48 23		42 50	51 37	
12	S. S. Rhætia	41 50	46 25		41 40	46 45	
12	S. S. Trave	42 30	47 03		42 17	48 19	
16	S. S. Rhætia	40 35	07 50		40 35	68 00	
18-19	S. S. Geiser	59 14	4 05	11 p. m.	57 32	15 58	9 a. m.
18	S. S. Sueva	41 56	50 14	4 p. m.	42 38	47 00	
18	S. S. Borderer	41 10	62 17		41 16	60 55	
19-20	S. S. Gothia	42 50	48 50		42 30	51 40	
19	S. S. St. Romans	40 45	62 06		40 42	64 05	
19	S. S. Norseman	42 23	64 58	7.20 a. m.	42 23	65 30	10 a. m.
19	S. S. Bothnia	42 20	48 00	1.30 a. m.	42 00	50 00	1.50 p. m.
19	S. S. Zaanland	41 20	48 25		41 00	50 40	
19	S. S. Borderer	41 44	53 20		42 57	46 07	
20	S. S. Devon	42 05	50 20		42 20	47 44	
20	S. S. Snale	41 53	47 02	8 p. m.	41 30	45 45	3.30 a. m.
19-20	S. S. Celtic	44 46	46 31	6 a. m.	43 23	51 52	4 a. m.
21	S. S. LaBretagne	43 05	48 35		42 45	50 00	
19-25	Dense fog prevailed at Saint John's, N. F.						
22-24	S. S. Britannic	41 51	54 11		42 51	48 50	
23	S. S. Gothia	40 40	70 30		40 36	71 20	
24	S. S. California	42 09	51 26		41 50	54 55	
25	S. S. Martello	41 25	49 00	2.30 a. m.	41 30	52 40	11 p. m.
25	S. S. Geiser	41 48	46 08	10.30 p. m.	40 41	49 09	8.30 p. m.
25	S. S. Cephalonia	41 49	61 00	7.30 a. m.	41 50	62 00	10.15 a. m.
29	S. S. Geiser	41 05	66 44	8 a. m.	41 06	67 53	1.30 p. m.
30	S. S. Wælsland	42 59	41 41		42 51	42 02	

Fog was most frequently encountered during the month along the southern edge of the ice-fields which extended to the southward of the Banks of Newfoundland, and the meteorological

conditions attending its formation were identical with those noted for the preceding month, *i. e.*, the intermingling of warm, humid air from the ocean to the southward, or from over the Gulf Stream, and the chilled air attending the ice-fields; the former being drawn to this locality by the cyclonic movement

of the atmosphere within the eastern or southern quadrants of areas of low barometric pressure. Of the eleven dates for which dense fog was reported in this locality, nine show the presence of the centres of areas of low pressure to the westward and two to the northwestward of the fog banks.

TEMPERATURE OF THE AIR (expressed in degrees, Fahrenheit).

The distribution of mean temperature over the United States and Canada for April, 1887, is exhibited on chart ii by the dotted isothermal lines. In the table of miscellaneous data are given the monthly mean temperatures, with the departures from the normal, for the various stations of the Signal Service, and in the figures above the geographical districts, the average temperature and departure for each district. The normal for any district may be found by adding the departure to the current mean for the district when the departure is below the normal, and subtracting when above. On chart iv the departures from the normal are illustrated by lines connecting stations of normal or equal abnormal values.

The mean temperature of the month is very nearly normal in all districts; the greatest departures occur in the central Mississippi and lower Missouri valleys, where the temperature has been, at different stations, from 2° 0 to 5° 9 warmer than the average April. In the west Gulf states and Texas it has been about 1° 0 above the normal; over the lower lake region, Canada, New England, and along the Atlantic coast it has been slightly below the normal, the average departure being 1° 5 and the greatest 3° 8 at Albany, N. Y. In the northern and middle Pacific coast regions the temperature of the month has been 0° 5 to 2° 4 below the normal, except at Sacramento, Cal., where the departure is 1° 3 above. On the 2d very low temperatures, for the season, prevailed over the south Atlantic states, east Gulf states, and Florida, producing in some sections light frosts. In the Lake region the minimum temperature of the month occurred at all stations on the 5th. The high temperatures of the 13th in the Ohio and central Mississippi valleys are noteworthy features of the meteorology of the month.

The following are some of the most marked departures from the normal temperature at Signal Service stations:

Above normal.		Below normal.	
Yankton, Dak.....	5.9	Albany, N. Y.....	3.8
Saint Louis, Mo.....	4.7	Mount Washington, N. H.....	3.0
Omaha, Nebr.....	4.5	Norfolk, Va.....	3.0
Fort Smith, Ark.....	3.8	Portland, Me.....	2.8
Fort Buford, Dak.....	3.3	Cedar Keys, Fla.....	2.7
Leavenworth, Kans.....	3.3	Key West Fla.....	2.7
Bismarck, Dak.....	2.8	Lynchburg, Va.....	2.5

DEVIATIONS FROM NORMAL TEMPERATURES.

In the table below are given, for certain stations, as reported by voluntary observers, the normal temperatures of April for a series of years, the mean temperature for April, 1887, and the departures from the normal:

Station.	County.	Normal temperature for April.	Number of years.	Mean temperature for April, 1887.	Departure.
<i>Arkansas.</i>					
Lead Hill.....	Boone.....	60.7	5	63.9	+ 3.2
<i>California.</i>					
Sacramento.....	Sacramento.....	59.2	21	57.3	- 1.9
<i>Connecticut.</i>					
Middletown.....	Middlesex.....	45.4	29	44.3	- 1.1
New Haven.....	New Haven.....	46.8	101	44.4	- 2.4
Waterbury.....	New Haven.....	46.6	12	43.0	- 3.6
<i>Dakota.</i>					
Webster.....	Day.....	44.8	4	45.3	+ 0.5
<i>Florida.</i>					
Archer.....	Alachua.....	65.8	4	62.2	- 3.6
<i>Illinois.</i>					
Collinsville.....	Madison.....	51.2	8	55.9	+ 4.7
Mattoon.....	Coles.....	51.6	7	53.0	+ 1.4
Peoria.....	Peoria.....	52.2	31	57.3	+ 5.1
Sycamore.....	De Kalb.....	46.5	6	48.2	+ 1.7

Deviations from normal temperatures—Continued.

Station.	County.	Normal temperature for April.	Number of years.	Mean temperature for April, 1887.	Departure.
<i>Indiana.</i>					
Lafayette.....	Tippecanoe.....	50.0	8	50.6	+ 0.6
Logansport.....	Cass.....	53.2	33	53.1	- 0.1
Vevay.....	Switzerland.....	54.8	21	53.9	- 0.9
<i>Iowa.</i>					
Creco.....	Howard.....	43.9	10	46.3	+ 2.4
Monticello.....	Jones.....	48.1	34	49.6	+ 1.5
Muscataine.....	Muscataine.....	48.5	49	50.8	+ 2.3
<i>Kansas.</i>					
Independence.....	Montgomery.....	57.1	16	59.8	+ 2.7
Wellington.....	Sumner.....	55.6	9	58.1	+ 2.5
<i>Louisiana.</i>					
Grand Coteau.....	Saint Landry.....	67.1	5	69.1	+ 2.0
<i>Maine.</i>					
Belfast.....	Waldo.....	43.6	26	39.1	- 4.5
Cornish.....	York.....	41.8	30	38.9	- 2.9
Orono.....	Penobscot.....	39.9	19	37.3	- 2.6
<i>Maryland.</i>					
Cumberland.....	Alleghany.....	51.5	15	49.2	- 2.3
Fallston.....	Harford.....	49.7	16	47.5	- 2.2
<i>Massachusetts.</i>					
Amherst.....	Hampshire.....	45.2	50	44.9	- 0.3
Cambridge.....	Middlesex.....	44.2	65	43.3	- 0.9
Fitchburg.....	Worcester.....	42.4	31	40.7	- 1.7
New Bedford.....	Bristol.....	44.5	75	43.1	- 1.4
Somerset.....	Bristol.....	45.4	17	45.3	- 0.1
Springfield.....	Hampden.....	46.0	20	45.2	- 0.8
Taunton.....	Bristol.....	46.5	16	43.6	- 2.9
Williamstown.....	Berkshire.....	41.9	33	39.5	- 2.4
<i>Nevada.</i>					
Carson City.....	Ormsby.....	47.8	8	48.1	+ 0.3
<i>New Brunswick.</i>					
Saint John.....	Saint John.....	37.4	27	37.0	- 0.4
<i>New Hampshire.</i>					
Concord.....	Merrimack.....	44.6	19	42.4	- 2.2
Hanover.....	Grafton.....	41.3	27	36.6	- 4.7
<i>New Jersey.</i>					
Dover.....	Morris.....	43.7	5	44.5	+ 0.8
South Orange.....	Essex.....	48.3	17	46.8	- 1.5
<i>New York.</i>					
Factoryville.....	Tioga.....	43.5	5	42.9	- 0.6
North Volney.....	Oswego.....	41.3	20	40.6	- 0.7
Palermo.....	Oswego.....	42.5	33	38.9	- 3.6
<i>Ohio.</i>					
Wauseon.....	Fulton.....	46.4	17	46.2	- 0.2
<i>Pennsylvania.</i>					
Wilkesbarre.....	Luzerne.....	48.2	9	44.9	- 3.3
<i>South Carolina.</i>					
Stateburg.....	Sumter.....	62.0	7	61.4	- 0.6
<i>Texas.</i>					
New Ulm.....	Austin.....	68.3	15	68.9	+ 0.6
<i>Vermont.</i>					
Lunenburg.....	Essex.....	37.9	38	35.9	- 2.0
Newport.....	Orleans.....	39.7	13	36.2	- 3.5
Stratford.....	Orange.....	40.8	13	37.6	- 3.2
<i>Virginia.</i>					
Bird's Nest.....	Northampton.....	54.8	16	52.7	- 2.1
Dale Enterprise.....	Rockingham.....	51.7	7	54.3	+ 2.6
Variety Mills.....	Nelson.....	54.1	10	51.2	- 2.9
Wytheville.....	Wythe.....	52.1	23	52.0	- 0.1
<i>West Virginia.</i>					
Helvetia.....	Randolph.....	48.5	11	47.7	- 0.8

* From the "Bulletin of the New England Meteorological Society."

The following notes on temperature are from the reports of voluntary observers:

Illinois.—Mattoon, Coles Co.: during the past eight years the warmest April occurred in 1880, mean temperature, 58° 0; the coldest in 1881 and 1885, mean, 47° 0. [The observer states that all temperature records at this station previous to April, 1887, are 2° 0 too high for readings between 26° and 39°, and 3° 0 too high from 50° to 80°.]

Indiana.—Logansport, Cass Co.: in the past thirty-three years the extreme April temperatures are 99° 0, in 1870, and 8° 0, in 1865.

Iowa.—Monticello, Jones Co.: during the past thirty-four years the extreme April temperatures are 94° 0, in 1865, and 12° 0, in 1874; the highest and lowest April means are 56° 0, in 1855, and 38° 0, in 1857.

Kansas.—Wellington, Sumner Co.: during the past nine years the warmest April occurred in 1880, mean temperature, 59° 6; the coldest in 1884, mean, 50° 7; the extremes of April in that time are 95° 0, in 1887, and 15° 0, in 1881.

Maryland.—Cumberland, Alleghany Co.: the temperature of April in the past fifteen years is shown in the following table: